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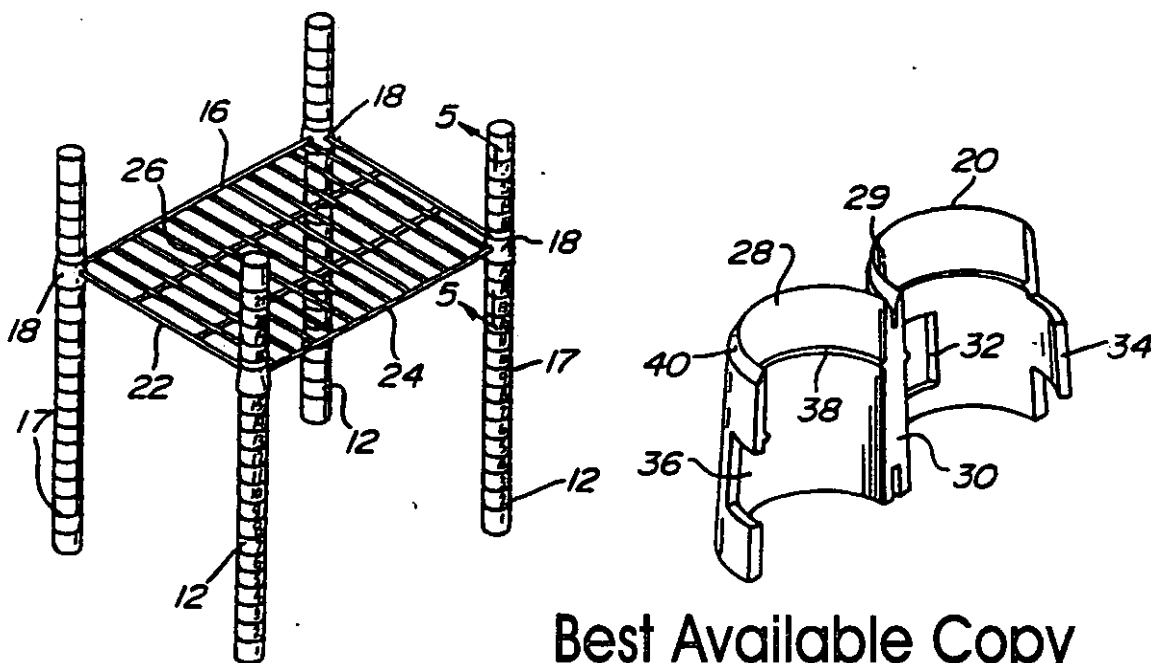
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(54) Title: SHELVING HAVING MULTIPART HINGED SHELF SUPPORT



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(57) Abstract

Post type shelving (10) having posts (12) with spaced grooves (17) which enable securement of a shelf support (20) which in turn gives support to shelving (16) and wherein the shelf support (20) is of one piece and includes at least two couplings (28, 29) hinged together.

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## SHELVING HAVING MULTIPART HINGED SHELF SUPPORT

### Field of the Invention

This invention relates to post type shelving and more particularly to post type shelving having multipart hinged shelf support. In recent years post type shelving has become quite popular since it can be readily assembled and disassembled, involves relatively few parts and is relatively strong.

### Known Prior Art

Post type shelving is shown in the prior art as exemplified by U.S. Patents 3,424,111 and 3,523,508. In the former patent there is shown a shelving system having a shelf member with corner supports located at each corner and wherein the corner supports have downwardly diverging interior surfaces which are adapted to receive and securely hold ground engaging corner posts. Prior to assembly the corner posts are fitted with post supports comprising separable complimentary couplings which possess an internal rib that rests in one of the spaced grooves that are formed in the post at regular intervals. Also, the exterior surface of the post supports is also downwardly diverging to snugly receive a corner support.

Another variation of the post type shelving can be found in U.S. Patent 3,675,598 wherein the complimentary couplings of the post supports are replaced with a unitary shelf support of a tubular nature which is slipped upon a post which does not have to have spaced grooves as in the case of U.S. Patents 3,424,111 and 3,523,508. Instead, the shelf support of U.S. Patent 3,675,598 is provided with a set screw that bears against the post in an engaging relationship.

The separable couplings of the post supports of U.S. Patents 3,424,111 or 3,523,508 offer both advantages and disadvantages as contrasted with the unitary collar or shelf support of U.S. Patent 3,675,598. At times the coupled post supports are favored because of the ability to locate the post supports at precise intervals along the posts wherever the grooves are formed in the post.

However, the coupled post supports at times have proved to be troublesome because of the relatively large number of

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pieces involved and the related problems in orienting the various pieces in proper relationship to the post. Even where one goes to a tubular type one piece shelf support there is still the problem of working the shelf support down onto the post to a desired position.

Moreover, it is necessary that the shelving be level. Sometimes it is difficult to judge by eye whether the couplings have all been engaged at the same level on each of ground engaging posts.

Furthermore, it has been found in some instances that the shelving of U.S. Patent 3,675,598 is troublesome in assembly since the precise leveling of the shelf supports can be difficult to achieve.

#### Objects and Summary of the Invention

In view of the foregoing it is an object of the present invention to provide a post type shelving having multipart hinged shelf supports which is unitary or of one piece.

Still another object of the present invention is to provide post type shelving having multipart hinged shelf supports where the components thereof are hinged together and cannot separate from each other.

Yet another object of the present invention is to provide post type shelving having multipart hinged shelf supports wherein one of the components of the shelf support possesses a window to enable the assembler to readily determine that a particular shelf support is located in a desirable engaging position in contact with a post.

The foregoing as well as other objects of the invention are achieved by providing post type shelving for use with shelves, wherein the shelves have open corner supports or collars at each corner. Each corner support has inner surfaces that diverge downwardly such that each corner support can mate with a complimentary downwardly diverging outer surface of a shelf support that is held to the post by engagement of an inner rib of the shelf support in one of the grooves of a ground engaging post.

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The shelf support itself is of one piece, basically comprising in the preferred embodiment hinged sections, one of which has a window. One of the hinged sections possesses a locking tab which is received in a snap fit in a complimentary recess in the other hinged section. In this way the unitary shelf support tightly engages the post and is not readily dislodged from its engagement with the post when the shelving is lowered upon the post so that one of the corner supports of the shelving is received about the complimentary shelf support.

#### Brief Description of the Drawings

Other objects and many of the attendant advantages of the invention will become more readily apparent by reference to the following figures of the drawings wherein:

Fig. 1 is a three-dimensional view showing the post type shelving of the present invention having multipart hinged shelf supports;

Fig. 2 is a three-dimensional view of one of the shelf supports wherein the hinged sections are in the open, disengaged position;

Fig. 3 is a fragmentary three-dimensional view showing the shelf support in open position about to be lowered and engaged upon one of the circular grooves of a post and wherein a corner support is juxtaposed above the shelf support;

Fig. 4 is a side elevational view of the shelf support in the closed or coupled position;

Fig. 5 is an enlarged sectional view taken along the lines 5-5 of Fig. 1; and

Fig. 6 is a sectional view taken along lines 6-6 of Fig. 1.

#### Detailed Description of the Invention

Referring now in greater detail to the various figures of the drawing wherein like reference characters refer to like parts there is shown generally at 10 in Fig. 1 post type shelving having multipart hinged shelf supports constituting the preferred embodiment of the present invention. The shelving comprises ground engaging tubular uprights or posts having upper and lower

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ends, such as those disclosed in U.S. Patent 3,424,111 the disclosure of which is incorporated herein by reference for this limited extent.

Also shown in Fig. 1 is a shelf 16 that has been mounted upon the posts 12. Obviously there will usually be two or more like shelves which will be positioned one above the other after final assembly. As shown in greater detail with reference to Fig. 3 each shelf 16 possesses at each corner a corner support having an inner surface which is tapered in a diverging manner in moving from top to bottom or downwardly in the manner of U.S. Patent 3,675,598, the disclosure which is incorporated herein to this limited extent. Also shown in Fig. 3 is the corner support 18 possessing a top opening 19 which is generally circular in cross-section. Because of the downward divergence the opening at the bottom of the corner support 18 is of a larger diameter than the opening 19 at the top of corner support 18.

The shelf supports 20 are shown in detail in both Figs. 2 and 3. Before discussing the details of the shelf supports, it should be noted that the shelf 16 comprises side rods 22, end rods 24 and parallel rods 26.

The shelf support 20 is basically comprised of sections or couplings 28 and 29 which are hinged together in a living flexible hinge 30, such that the entire shelf support is a single molded piece or is unitary.

Also formed in one of the couplings 28 or 29 is a window 32. As seen in Figs. 2 and 3 the window 32 is formed in the coupling 29.

As further shown in Figs. 2 and 3 the coupling 29 possesses a locking tab 34 which is received in a snap-fit in the complimentary recess 36 in the coupling 28. If desired the locking tab can extend from coupling 28 and the recess from coupling 29.

The shelf support 20 also includes, preferably in each coupling, a continuous convex bead or ridge 38 which extends outwardly from the inner surface of both of the couplings 28 and 29. The ridge 38 is received in one of the spaced recesses 33 in the post. The window 32 is so located in one of the couplings 28.

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or 29 of the shelf support 20 that one of the numbers on the posts can be viewed through the window 32. Thus, the person doing the assembly can readily determine the precise location of the shelf support which is important in making sure that all of the shelf supports are located at the same level on each of the posts.

Finally, the shelf support possesses a beveled upper edge 40 which assists in the guiding of the corner support 18 downwardly about the shelf support to reach the seated position shown in Fig. 5.

It can be seen that the present invention is easily assembled. Where the shelving system will comprise four ground engaging posts or posts forming another system, such as a cart, it is a simple matter to locate the one piece shelf support 20 of the present invention in a particular desired spaced post groove. The location process simply involves engaging the bead 38 in the appropriate circular groove while the shelf support sections are brought together in a snap-fit wherein the locking tab 34 engages in the recess 36. This operation is repeated by engaging a shelf support 20 on the other posts. Then, the shelf is lowered in such a way that each corner support 18 engages one of the posts 12 and is slid home wherein the conical or tapered inner surface of the corner support 18 engages about the outer surface of each shelf support 20 to reach the position of Fig. 5. Where desired a mallet may be used to tap home the shelf in such a manner that each corner support tightly engages a complimentary shelf support.

The various components described hereinabove may be of metal, like an aluminum alloy, but also may in some cases, like the shelf support, be of a plastic, like 20% talc filled standard polypropylene.

Without further elaboration, the foregoing will so fully illustrate my invention that others may, by applying future knowledge, adopt the same for use under various conditions of service.

What is claimed as the invention is:

1. In post type shelving comprising at least one vertically extending post having an upper and a lower end and spaced grooves in said post, a shelf support having a convex bead located in one of said grooves such that said shelf support engages said post and at least one shelf having one or more corner supports, each having a tapered opening diverging toward said post lower end and with the outer surface of said shelf support having a tapered surface complimentary with said corner support opening whereby said shelf is positioned with reference to said shelf support so that said shelf support is at least in part positioned within said corner support opening and the tapered surfaces of said shelf support and corner support opening are in engaging relationship such that said shelf support acts to support said shelf and wherein said shelf support is one piece and comprises at least two couplings hinged together.

2. The shelving of Claim 1 wherein said shelf support couplings fit together in a snap fit.

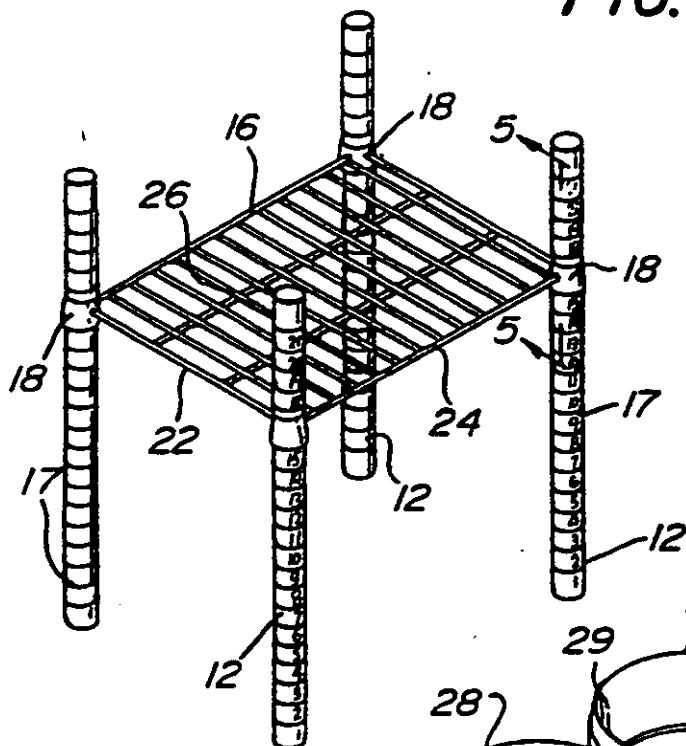
3. The shelving of Claim 2 wherein one of said couplings has a tab which makes a snap fit in a recess in another of said couplings.

4. The shelving of Claim 1 wherein said post has spaced numbers adjacent to said grooves and one of said shelf support couplings has a window to permit viewing of at least one of said numbers.

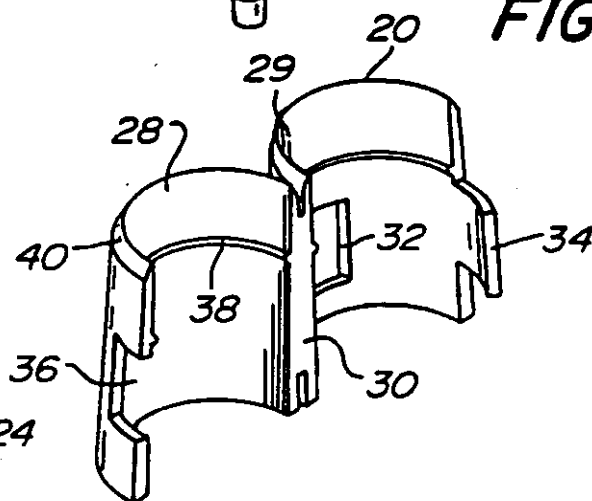


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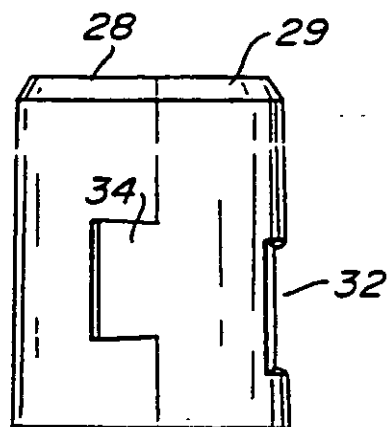
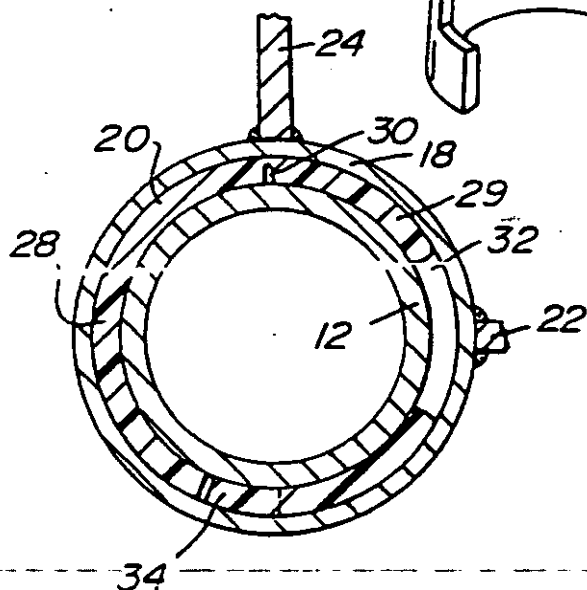
**FIG. 1**



**FIG. 2**

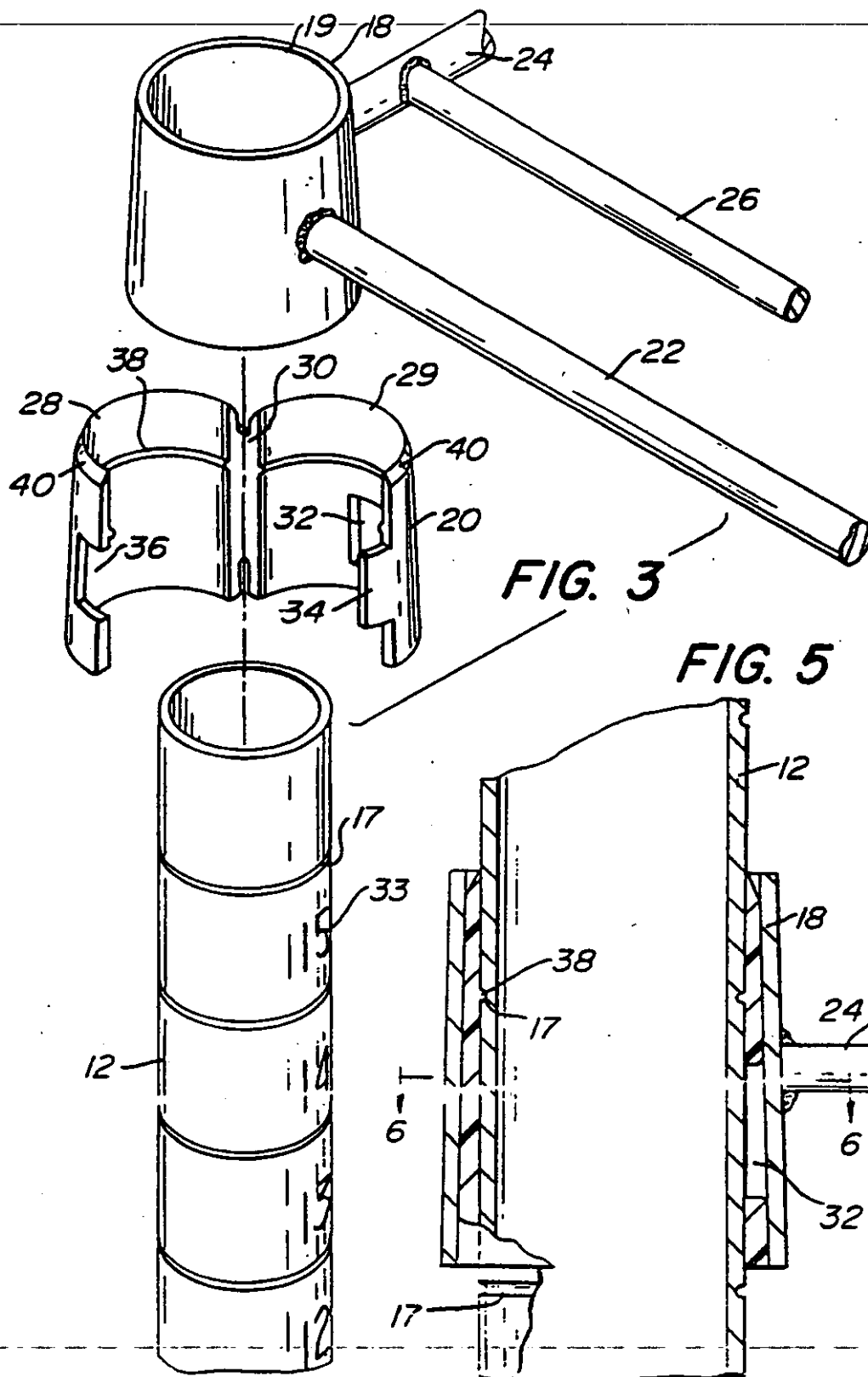


**FIG. 6**



**FIG. 4**

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# SUBSTITUTE SHEET

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 89/02067

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC (4): A47B 9/00; A47B 47/00		
U.S. Cl. 108/144; 211/187		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
US	108/154, 144, 146, 148, 111, 107; 211/187; 211/487, 573; 403/344	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>9</sup>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
Y	US, A, 3,757,705 (MASLOW) 11 September 1973, see the entire document.	1, 2, 3, 4
A	US, A, 4,478,381 (PITTON ET AL.) 23 October 1984, see the entire document.	
A	US, A, 4,595,107 (WELSCH) 17 June 1986, see the entire document.	
A	US, A, 4,629,077 (NIBLOCK) 16 December 1986, see the entire document.	
Y	US, A, 4,635,563 (HAND ET AL.) 13 January 1987, see the entire document.	1, 2, 3, 4
A	US, A, 4,637,097 (SECORD) 20 January 1987, see the entire document.	
A	US, A, 4,656,952 (SCHWEIZER) 14 April 1987, see the entire document.	
Y, P	US, A, 4,811,670 (KOLVITES ET AL.) 14 March 1989, see the entire document.	4
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<b>IV. CERTIFICATION</b>		
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